

Claims

1. An apparatus comprising:

a patent foramen ovale (PFO) closure device having a deployed configuration for providing compressive force to septum primum and septum secundum and including:

5 a central body for extending through the PFO,

a first end cap, and

first and second loops on one side of the PFO, each of the first and second loops extending from the central body to the first end cap, each of the first and second loops defining a plane substantially parallel to septum primum and septum secundum
10 such that the first and second loops apply a force, perpendicular to the plane, to one of septum primum and septum secundum.

2. The apparatus of claim 1, further comprising, on the other side of the PFO, a plurality of struts extending radially from the central body and having ends for contacting one of septum primum and septum secundum.

15 3. The apparatus of claim 1, further comprising, on the other side of the PFO, a second end cap, and third and fourth loops on one side of the PFO, each of the third and fourth loops extending from the central body to the first end cap and second end cap, each of the third and fourth loops defining a plane substantially parallel to septum primum and septum secundum such that the first and second loops apply a force,
20 perpendicular to the plane, to one of septum primum and septum secundum.

4. The apparatus of claim 3, where there are three or more loops on each side of the PFO.
5. The apparatus of claim 3, wherein the central body and the first and second end caps are oriented in a line substantially perpendicular to septum primum and septum secundum.
6. The apparatus of claim 1, wherein the device has a collapsed configuration for delivery through a catheter.
7. The apparatus of claim 6, wherein the device includes nitinol.
8. The apparatus of claim 6, wherein the device includes a shape memory polymeric material.
9. The apparatus of claim 6, wherein the device is made from a shape memory material with properties such that the device, when delivered into a body, has a phase transition and assumes the deployed configuration.
10. The apparatus of claim 1, wherein the device is retrievable, redeployable, and repositionable.
11. The apparatus of claim 1, further comprising a material over the first and second loops for promoting tissue ingrowth.
12. The apparatus of claim 11, wherein the loops are made of a bioresorbable material.
13. The apparatus of claim 3, further comprising a material over the first and second

loops for promoting tissue ingrowth.

14. A method comprising delivering the PFO closure device of claim 1 through a catheter to a PFO.

5 15. A method comprising delivering the PFO closure device of claim 2 through a catheter to a PFO.

16. A method comprising delivering the PFO closure device of claim 3 through a catheter to a PFO.

17. A method comprising delivering the PFO closure device of claim 4 through a catheter to a PFO.

10 18. A method comprising delivering the PFO closure device of claim 1 through a catheter to a PFO, wherein the device includes a shape memory material.

19. A method comprising delivering the PFO closure device of claim 10 through a catheter to a PFO.

15 20. A method comprising delivering the PFO closure device of claim 11 through a catheter to a PFO.

21. A method comprising delivering the PFO closure device of claim 12 through a catheter to a PFO.

22. A method comprising delivering the PFO closure device of claim 12 through a catheter to a PFO, and drawing the device back into the catheter..

23. An apparatus comprising:

a septal defect closure device having a deployed configuration for providing compressive force to septum primum and septum secundum and including:

5 a central body for extending through the defect,

a first end cap, and

10 first and second loops on one side of the defect, each of the first and second loops extending from the central body to the first end cap, each of the first and second loops defining a plane substantially parallel to septum primum and septum secundum such that the first and second loops apply a force, perpendicular to the plane, to one of septum primum and septum secundum.

24. A method comprising delivering the closure device of claim 23 through a catheter to a septal defect.